PSAD CIVIL ENGINEERING LICENSURE EXAMINATION (CELE) PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

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How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

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Questions

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1. In contract administration, what is the purpose of a change order?

A. To Document and Authorize Changes in Scope, Cost, or Schedule Agreed by the Parties

B. To Terminate the Contract

C. To Assign a New Contractor

D. To Increase Payment Without Change in Scope

2. Statement: A fixed-end beam under uniform load has the maximum shear at the supports.

A. True

B. False

C. Only at midspan

D. Only at quarter-span

3. What is the formula for the reinforcement ratio ρ in a rectangular section?

A. ρ = As / (b d)

B. ρ = As / (b d t)

C. ρ = As / (b t)

D. ρ = As / (b d^2)

4. Which term describes the longest path through a project network that dictates the project duration in CPM?

A. Critical path

B. Float path

C. Decisive line

D. Baseline path

5. In CPM scheduling, Late Finish is defined as the latest time an activity can finish without delaying the project.

A. The earliest time an activity can finish.

B. The latest time an activity can finish without delaying the project.

C. The latest time an activity can start without delaying the project.

D. The earliest time an activity can start.

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6. How many unknown reactions does a fixed support provide in the plane?

A. One

B. Two

C. Four

D. Three

7. Which statement correctly compares solid and hollow circular shafts with the same outer diameter D?

A. A hollow shaft always has a greater J than a solid shaft with the same outer diameter

B. A hollow shaft has a smaller J than a solid shaft with the same outer diameter when the inner diameter is greater than zero

C. J is independent of inner diameter

D. J for hollow equals J for solid when inner diameter equals outer diameter

8. Which formula is the correct definition of Rn, the coefficient of resisting moment?

A. Rn = Mu / φbd^2

B. Rn = Mu / φbd

C. Rn = Mu φbd^2

D. Rn = φbd^2 / Mu

9. In structural load concepts, what is the difference between dead load and live load?

A. Live load is the permanent weight of fixed components; dead load is the variable load from occupants, furniture, and usage.

B. Dead load is the weight of the soil.

C. Live load is the fixed equipment weight.

D. Dead load includes wind and seismic loads.

10. If the diameter of a solid shaft is doubled while torque remains the same, by what factor does the maximum shear stress τmax change (τmax 1/D^3)?

A. 1/2

B. 1/4

C. 1/8

D. 1/16

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Answers

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1. A
2. A
3. A
4. A
5. B
6. D
7. B
8. A
9. C
10. C

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Explanations

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1. In contract administration, what is the purpose of a change order?

A. To Document and Authorize Changes in Scope, Cost, or Schedule Agreed by the Parties

B. To Terminate the Contract

C. To Assign a New Contractor

D. To Increase Payment Without Change in Scope

When a project needs alterations after the contract is signed, a change order serves as the formal instrument to record and authorize those modifications. It captures exactly what is changing in the work, how much extra (or less) it will cost, and how the project timeline will be affected, with approval from the parties involved. This creates a clear, auditable record so everyone understands the new scope, price, and schedule, and it ensures payment and scheduling adjustments are made only with mutual agreement. In practice, a change order documents the changed scope, any revised quantities or unit prices, and the revised completion date, tying everything back to the original contract terms.

2. Statement: A fixed-end beam under uniform load has the maximum shear at the supports.

A. True

B. False

C. Only at midspan

D. Only at quarter-span

Vertical shear in a fixed-end beam under a uniform load is highest at the ends. The end reactions balance the total load, and by symmetry each end carries half of the total load, so $R_A = R_B = wL/2$. The internal shear at a section a distance x from the left is $V(x) = R_A - w x$. With $R_A = wL/2$, this becomes $V(x) = wL/2 - w x$, a linear function that starts at $V(0) = wL/2$ at the left support and ends at $V(L) = -wL/2$ at the right support, crossing zero at midspan. Thus the maximum magnitude of shear occurs at the supports, equal to $wL/2$. The statement is true because the shear is largest at the ends and zero at midspan.

3. What is the formula for the reinforcement ratio ρ in a rectangular section?

A. ρ = As / (b d)

B. ρ = As / (b d t)

C. ρ = As / (b t)

D. ρ = As / (b d^2)

The quantity ρ measures how much steel is provided relative to the concrete area that participates in bending. For a rectangular beam, the area of steel in tension is As, and the concrete area that works with the steel in the bending plane is approximately the width times the effective depth, b d. Therefore the reinforcement ratio is ρ = As / (b d). Here, d is the distance from the extreme compression fiber to the centroid of the tension reinforcement, and b d gives an area, making ρ dimensionless as it should be. The other expressions would mix in quantities like thickness or square the depth, which don't represent the actual concrete area engaged in flexure, so they don't yield the correct dimensionless ratio.

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4. Which term describes the longest path through a project network that dictates the project duration in CPM?

A. Critical path

B. Float path

C. Decisive line

D. Baseline path

The longest path through a project network that dictates the project duration in CPM is called the critical path. In the Critical Path Method, each activity has a duration, and you compute early start/finish and late start/finish times to find each activity's slack (float). The path with zero total slack is the critical path, meaning there's no room to delay any activity on that route without delaying the entire project finish date. Because this path controls the project's finish time, its duration sets the project duration. If there are multiple paths with zero slack, they're all critical and share the same overall duration. All other paths have positive slack and can slip a bit without affecting the project end date.

5. In CPM scheduling, Late Finish is defined as the latest time an activity can finish without delaying the project.

A. The earliest time an activity can finish.

B. The latest time an activity can finish without delaying the project.

C. The latest time an activity can start without delaying the project.

D. The earliest time an activity can start.

Late Finish is the deadline for completing an activity that keeps the overall project on track. In CPM, you determine this by working backward from the project's finish time: the activity must finish no later than the earliest start among its successors, so its Late Finish is the minimum of those successor start times. From that, you get the latest possible start as Late Finish minus the activity's duration. This boundary shows whether an activity has any slack; if its Late Finish equals its Early Finish, it has zero slack and lies on the critical path. Other times describe when an activity could finish or start under different conditions (earliest finish, latest start, earliest start), which are distinct from the latest finish boundary that ensures the project deadline isn't missed.

6. How many unknown reactions does a fixed support provide in the plane?

A. One

B. Two

C. Four

D. Three

A fixed support constrains movement in the plane in three ways: it resists translation in the horizontal and vertical directions and it also resists rotation. Because of these three restraints, it introduces three unknown reactions: a horizontal reaction, a vertical reaction, and a moment about the connection. Those three reactions are what the equilibrium equations must balance against the external loads acting on the member. Think of it this way: the horizontal and vertical reactions carry the forces that keep the member from sliding in either direction, while the moment reaction carries the bending effect that would otherwise cause the member to rotate at the joint. A pin support would provide only two reactions (no moment), and a roller would provide just one reaction (perpendicular to its allowed motion). The fixed connection's ability to resist rotation is what adds that extra, third reaction.

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7. Which statement correctly compares solid and hollow circular shafts with the same outer diameter D?

A. A hollow shaft always has a greater J than a solid shaft with the same outer diameter

B. A hollow shaft has a smaller J than a solid shaft with the same outer diameter when the inner diameter is greater than zero

C. J is independent of inner diameter

D. J for hollow equals J for solid when inner diameter equals outer diameter

The main idea is how the polar moment of inertia (J) for a shaft depends on its cross section. For torsion, J measures resistance to twist. A solid circular shaft of diameter D has J = (π/32) D^4. A hollow circular shaft with outer diameter D and inner diameter d has J = (π/32) (D^4 − d^4). Since d > 0 for a hollow shaft, D^4 − d^4 is less than D^4, so J_hollow is smaller than J_solid. Therefore, with the same outer diameter, the hollow shaft resists torsion less when there is any material removed (inner diameter greater than zero). If there were no hole (d = 0), they would be the same; if the wall thickness vanished (d approaches D), J would approach zero.

8. Which formula is the correct definition of Rn, the coefficient of resisting moment?

A. Rn = Mu / φbd^2

B. Rn = Mu / φbd

C. Rn = Mu φbd^2

D. Rn = φbd^2 / Mu

The essential idea is that Rn is a dimensionless coefficient that links the actual resisting moment to the section's bending scale, encapsulated by φ times b times d squared. By defining Rn as Mu divided by φ b d^2, you express Mu as Mu = Rn × φ b d^2. This means Rn represents how many times the scaled cross-section capacity (φ b d^2) fits into the ultimate moment Mu. Using this form keeps the units consistent and shows clearly that the geometry (b and d) and the material strength factor (φ) set the design scale, while Rn captures the intrinsic capacity of the member independent of size. The other forms disrupt this relationship: they either omit the square on depth, place φ in the wrong position, or invert the ratio, which would not yield a proper, dimensionless coefficient for resisting moment.

9. In structural load concepts, what is the difference between dead load and live load?

A. Live load is the permanent weight of fixed components; dead load is the variable load from occupants, furniture, and usage.

B. Dead load is the weight of the soil.

C. Live load is the fixed equipment weight.

D. Dead load includes wind and seismic loads.

In structural load concepts, the main idea is distinguishing constant, permanent weight from variable, movable weight. Dead load is the permanent, static weight of the structure and all fixed components that are part of it—things like beams, slabs, walls, and fixed equipment. These loads don't change with time or occupancy. Live load, on the other hand, is the variable load that can change in magnitude and location during the building's life, such as people, furniture, movable equipment, and other use-related loads. Wind and seismic loads are separate environmental effects that are designed for in addition to dead and live loads. So, fixed equipment weight is part of dead load, not live load.

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10. If the diameter of a solid shaft is doubled while torque remains the same, by what factor does the maximum shear stress τmax change (τmax 1/D^3)?

A. 1/2

B. 1/4

C. 1/8

D. 1/16

For a solid circular shaft under torsion, the maximum shear stress scales with the inverse cube of the diameter: τmax 1/D^3. This comes from the torsion relation τ = T c / J, with J = π D^4 / 32 and c = D/2, giving τmax = 16T / (π D^3). If the diameter is doubled while the torque stays the same, the new τmax becomes 16T / (π (2D)^3) = (1/8) × [16T / (π D^3)]. So τmax is reduced to one-eighth of its original value.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://psadcele.examzify.com

We wish you the very best on your exam journey. You've got this!

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